- 1. A therapeutic composition comprising a first agent that targets an interleukin-15 receptor (IL-15R) and a second agent that inhibits a costimulatory signal transmitted between a T cell and an antigen-presenting cell (APC).
- 2. The therapeutic composition of claim 1, wherein the first agent comprises a substantially pure mutant IL-15 polypeptide that binds a subunit of an IL-15R.
- 3. The therapeutic composition of claim 2, wherein the subunit is an IL-15R α subunit.
- 4. The therapeutic composition of claim 3, wherein the mutant IL-15 polypeptide has a mutation at position 149 of SEQ ID NO:2.
- 5. The therapeutic composition of claim 3, wherein the mutant IL-15 polypeptide has a mutation at position 156 of SEQ ID NO:2.
- 6. The therapeutic composition of claim 5, wherein the mutant IL-15 polypeptide also has a mutation at position 149 of SEQ ID NO:2.
- 7. The therapeutic composition of claim 5, wherein the mutation at position 156 of SEQ ID NO:2 is a substitution of aspartate for glutamine.
- 8. The therapeutic composition of claim 6, wherein the mutation at position 149 of SEQ ID NO:2 is a substitution of aspartate for glutamine.
- 9. The therapeutic composition of claim 6 wherein the mutant IL-15 polypeptide has a substitution of aspartate for glutamine at positions 149 and 156 of SEQ ID NO:2.
- 10. The therapeutic composition of claim 2, wherein the first agent further comprises a moiety that leads to the elimination of IL-15R-bearing cells.
- 11. The therapeutic composition of claim 10, wherein the moiety that lyses IL-15R-bearing cells is an Fc region of an IgG molecule.

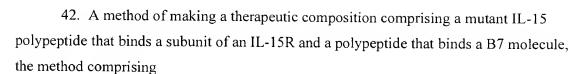
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- 12. The therapeutic composition of claim 1, wherein the first agent comprises a substantially pure anti-IL15R antibody.
- 13. The therapeutic composition of claim 1, wherein the second agent comprises a substantially pure polypeptide that binds a B7 molecule.
 - 14. The therapeutic composition of claim 13, wherein the B7 molecule is B7-1.
 - 15. The therapeutic composition of claim 13, wherein the B7 molecule is B7-2.
- 16. The therapeutic composition of claim 13, wherein the polypeptide that binds B7 is a polypeptide comprising CTLA4/Ig.
- 17. The therapeutic composition of claim 13, wherein the polypeptide that binds B7 comprises an anti-B7 antibody.
- 18. The therapeutic composition of claim 1, wherein the second agent comprises a substantially pure polypeptide that binds CD28.
- 19. The therapeutic composition of claim 18, wherein the polypeptide that binds CD28 comprises an anti-CD28 antibody.
- 20. The therapeutic composition of claim 1, wherein the second agent comprises a substantially pure polypeptide that binds to CD40L.
- 21. The therapeutic composition of claim 20, wherein the polypeptide that binds to CD40L is a polypeptide comprising an anti-CD40L antibody.
- 22. The therapeutic composition of claim 1, wherein the second agent comprises a substantially pure polypeptide that binds to CD40.
- 23. The therapeutic composition of claim 1, wherein the polypeptide that binds to CD40 is a polypeptide comprising an anti-CD40 antibody.

- 24. A method of suppressing an immune response in a patient, the method comprising administering to the patient a therapeutic composition comprising a first agent that targets an IL-15R and a second agent that inhibits a costimulatory signal transmitted between a T cell and an antigen presenting cell (APC).
- 25. The method of claim 24, wherein the patient has an immune disease, particularly an autoimmune disease, or is at risk of developing an immune disease, particularly an autoimmune disease.
- 26. The method of claim 25, wherein the autoimmune disease is a rheumatic disease selected from the group consisting of systemic lupus erythematosus, Sjögren's syndrome, scleroderma, mixed connective tissue disease, dermatomyositis, polymyositis, Reiter's syndrome, and Behcet's disease.
 - 27. The method of claim 25, wherein the autoimmune disease is rheumatoid arthritis.
 - 28. The method of claim 25, wherein the autoimmune disease is type I diabetes.
- 29. The method of claim 25, wherein the autoimmune disease is an autoimmune disease of the thyroid selected from the group consisting of Hashimoto's thyroiditis and Graves' Disease.
- 30. The method of claim 25, wherein the autoimmune disease is an autoimmune disease of the central nervous system selected from the group consisting of multiple sclerosis, myasthenia gravis, and encephalomyelitis.
- 31. The method of claim 25, wherein the autoimmune disease is a variety of phemphigus selected from the group consisting of phemphigus vulgaris, phemphigus vegetans, phemphigus foliaceus, Senear-Usher syndrome, and Brazilian phemphigus.
 - 32. The method of claim 25, wherein the autoimmune disease is psoriasis.

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- 33. The method of claim 25, wherein the autoimmune disease is inflammatory bowel disease.
- 34. The method of claim 25, wherein the patient has acquired immune deficiency syndrome (AIDS).
- 35. The method of claim 25, wherein the patient has received a transplant of a biological organ, tissue, or cell.
 - 36. The method of claim 25, wherein the patient has received a vascular injury.
 - 37. The method of claim 25, wherein the patient has type II diabetes.
- 38. A method of eliminating a cell that expresses a receptor for IL-15, the method comprising exposing the cell to the therapeutic composition comprising a first agent that targets an IL-15R and a second agent that inhibits a costimulatory signal transmitted between a cell of the immune system and an antigen presenting cell.
 - 39. The method of claim 38, wherein the cell is a cell of the immune system.
 - 40. The cell of claim 38, wherein the cell is a malignant cell.
- 41. A method of diagnosing a patient as having a disease or condition that can be treated with the therapeutic composition of claim 1, the method comprising obtaining a sample of tissue from the patient and exposing the sample to an antigenically-tagged polypeptide that targets an IL-15R, wherein the occurrence of binding of the polypeptide to a cell in the sample indicates that the cell can be bound by an agent that targets an IL-15R *in vivo* and thereby inhibited from proliferating in response to wild-type IL-15 *in vivo*.



- (a) purifying the mutant IL-15 polypeptide from an expression system and
- (b) purifying the polypeptide that binds B7 from an expression system; and
- (c) combining the IL-15 polypeptide and the polypeptide that binds B7.